

Of mulberry trees and silkworms

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Garden Tales

Mulberry fruits are a good summer memory for me — munching on mulberries when I happen to come across a tree laden with ripe fruit. The fruits are sweet, and the ground under the trees typically sticky with ones that have already fallen.

Unfortunately, mulberries ripen quickly and don't store well fresh, which is why we don't find them sold in local stores. However, in countries like Afghanistan, sacks of dried mulberries are sold in marketplaces, and eaten as snacks.

Two species of mulberry (*Morus*) grow wild in Delaware. Oddly, the species that is much more common is the non-native white mulberry (*Morus alba*), whereas the native red mulberry (*Morus rubra*) is encountered far less often. Both are small to medium-sized trees with similar-looking leaves that may be unlobed, or one- to three-lobed, on the same tree. Both species also have similar fruits, which at maturity are dark purple in red mulberry, and range in color from white, pink, purple to almost black in white mulberry.

The fruits of the red mulberry are said to be tastier. Although these

two species can be difficult to distinguish, red mulberry leaves are hairy beneath, whereas white mulberry leaves are hairless beneath (except there may be sparse hairs on the veins). In addition, another species, the black mulberry (*Morus nigra*), is cultivated in some places for its edible fruits.

The story of white mulberry's introduction to North America involves silk. Silk comes from the cocoons of silkworms, which eat mulberry leaves. When I look at the cocoon of a silkworm, I'm amazed that anyone ever thought of unwinding the silk that makes up the cocoon, and then weaving cloth from it. But this did happen, several thousand years ago in China, where the silkworm was domesticated.

The silkworm doesn't exist in the wild, and depends entirely on humans. The silkworm, the larva of the silkworm, produces a cocoon consisting of a silken thread 1,000 to 3,000 feet long. One pound of silk requires 2,000 to 3,000 cocoons. In an attempt to establish a silk industry in North America, white mulberries and silk-

worms were introduced before the American Revolution by the British, and again in great numbers in the 1830's. The silk industry failed here, but the introduced white mulberry trees thrived, to the point where they are now widespread and invasive in some parts of our continent.

The non-native white mulberry is on the invasive species watchlist in Delaware, and it sprouts easily in unmowed yards, fields, and woods edges. Native to China, it was first recorded growing wild in Delaware in 1896.

The native red mulberry is listed as an uncommon species in Delaware, meaning that it has only 21-50 known populations in the state, and might become of conservation concern in the future if more populations become extirpated. It grows in rich woods and edges. A good source of information about the plants of Delaware is the Flora of Delaware Online Database <http://www.wra.udel.edu/de-flora>. White mulberry is hybridizing with red mulberry, and thus threatening the genetic viability of our native species.

Another member of the mulberry family, paper-mulberry (*Brousson-*

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Delaware State University/Dr. Susan Yost

White mulberry trees (*Morus alba*) were introduced to North America in a failed attempt to establish a silk industry here. Silkworms (larvae of the silkworm) eat mulberry leaves. The inset photo shows silkworm cocoons, from which silk is derived.

subject of a "Garden Tales" article in December. This tree is adventive in Delaware, meaning that it's native to another part of the U.S., but has naturalized here.

Every tree species has an interesting tale to tell, and that of mulberry involves an uncommon native species, an invasive non-native species, edible fruits, and the production of silk.

On the campus of Delaware State University, the Claude E. Phillips Herbarium is Delaware's center for research, education, and outreach about plant identifications, locations, and uses. Call 857-6452 (Dr. Susan Yost, Herbarium Educator) to arrange a tour of the herbarium, or for more information about this article.

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etia papyrifera), also grows in Delaware, where it escapes into disturbed areas. It is native to Asia, and was first detected in Delaware in 1924. This small tree has leaves that are often lobed. As its common name indicates, the bark of paper-mulberry can be used to make paper, and it's also used in the Pacific Ocean islands to make bark cloth (tapa). Paper-mulberry, like white mulberry, is also on the invasive species watchlist in Delaware.

The fourth member of the mulberry family to be found growing wild in Delaware is Osage-orange (*Maclura pomifera*), which was the